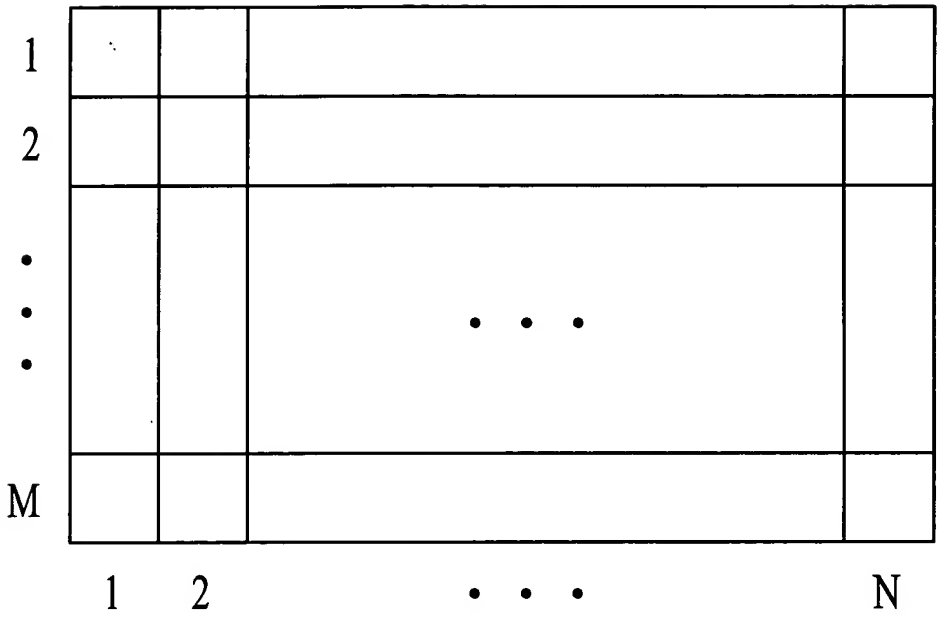


Set - associative caching device organized as
M number of sets with N elements in each set.

FIG.1
(PRIOR ART)

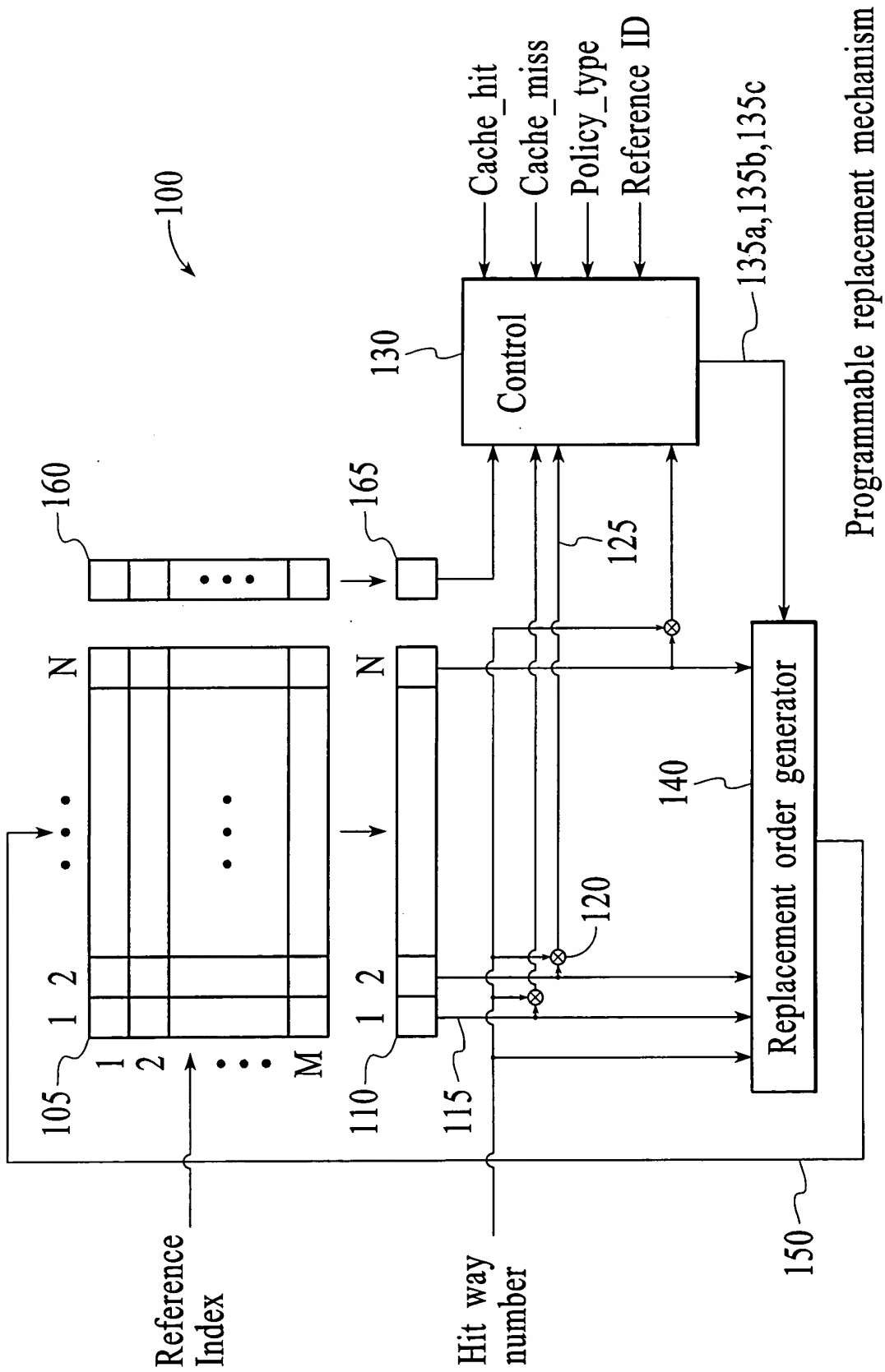


FIG.2

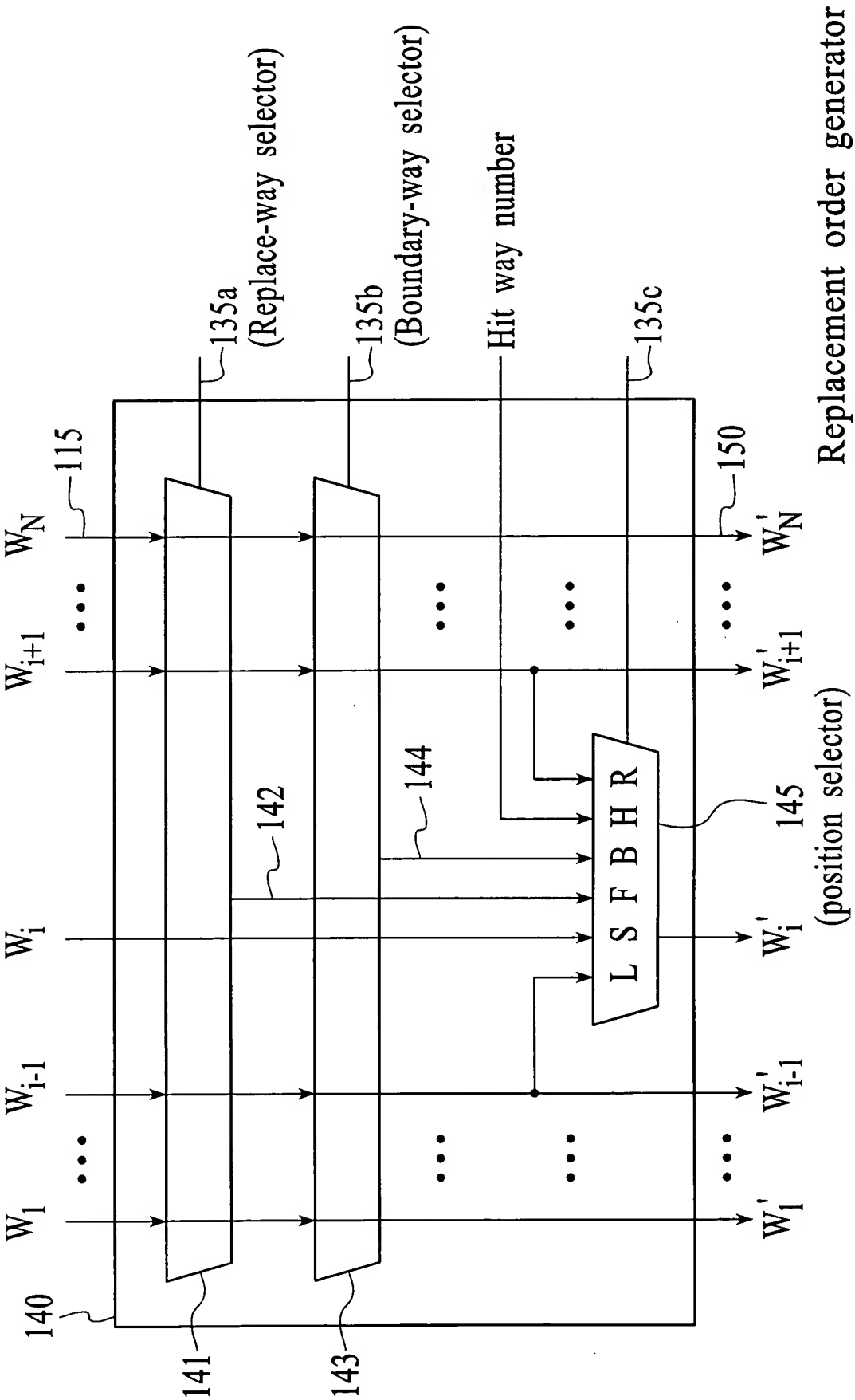
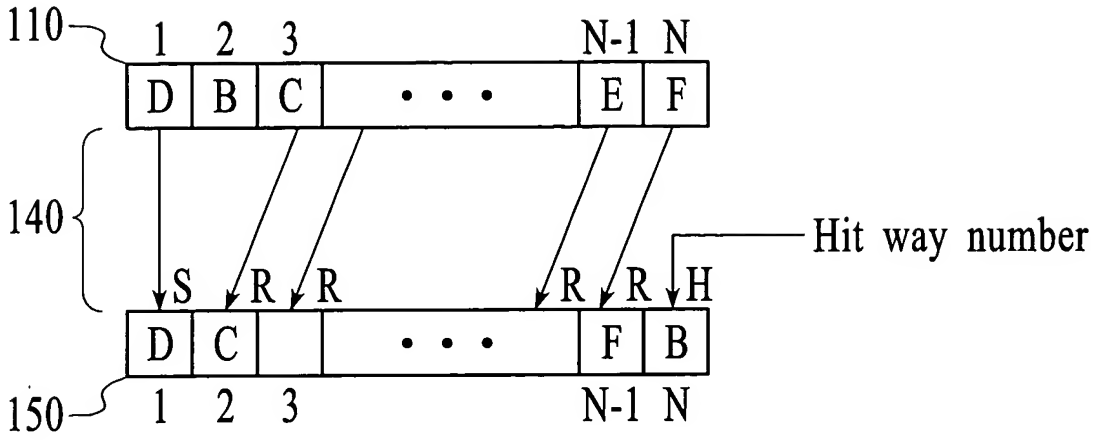
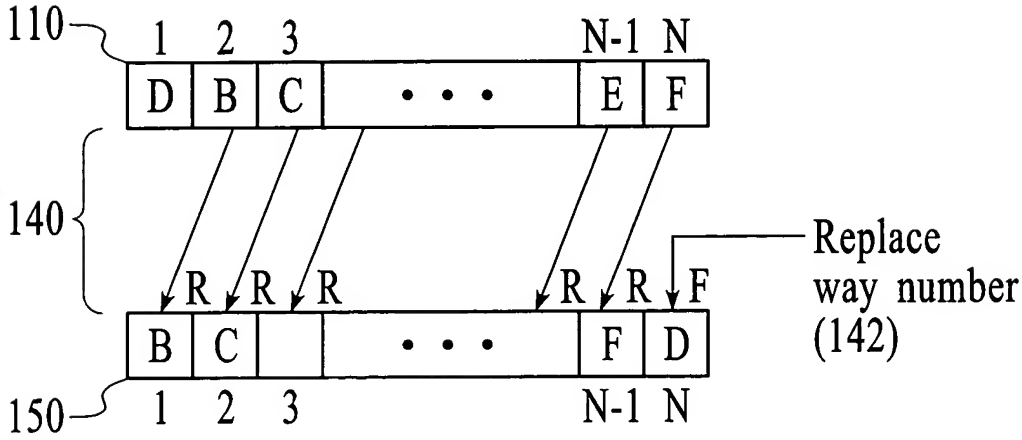


FIG.3



Replacement order generator producing new replacement order when a reference is hit on element residing in way B.

FIG.4



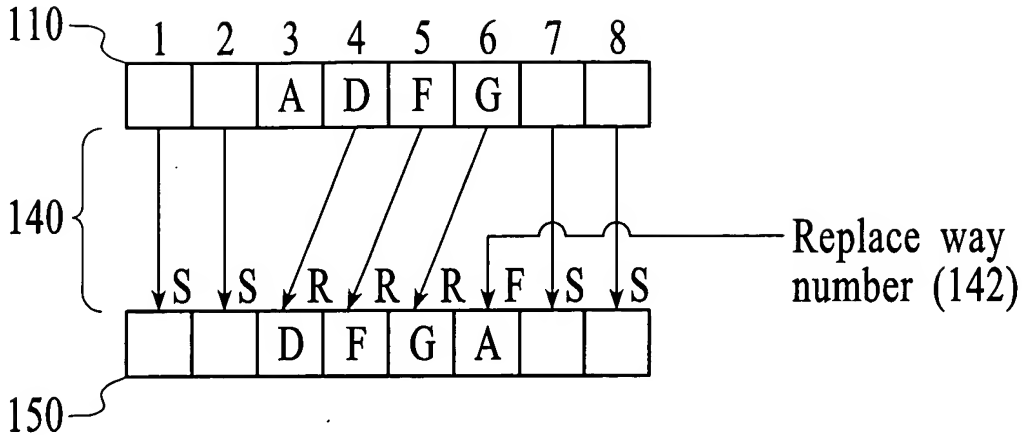
Replacement order generator producing new replacement order when a reference is a miss.

FIG.5

Access Result	mux 1	mux 2	mux 3	mux 4	mux 5	mux 6	mux 7	mux 8
miss	R	R	R	R	R	R	R	F
hit 1	R	R	R	R	R	R	R	H
hit 2	S	R	R	R	R	R	R	H
hit 3	S	S	R	R	R	R	R	H
hit 4	S	S	S	R	R	R	R	H
hit 5	S	S	S	S	R	R	R	H
hit 6	S	S	S	S	S	R	R	H
hit 7	S	S	S	S	S	S	R	H
hit 8	S	S	S	S	S	S	S	H/S

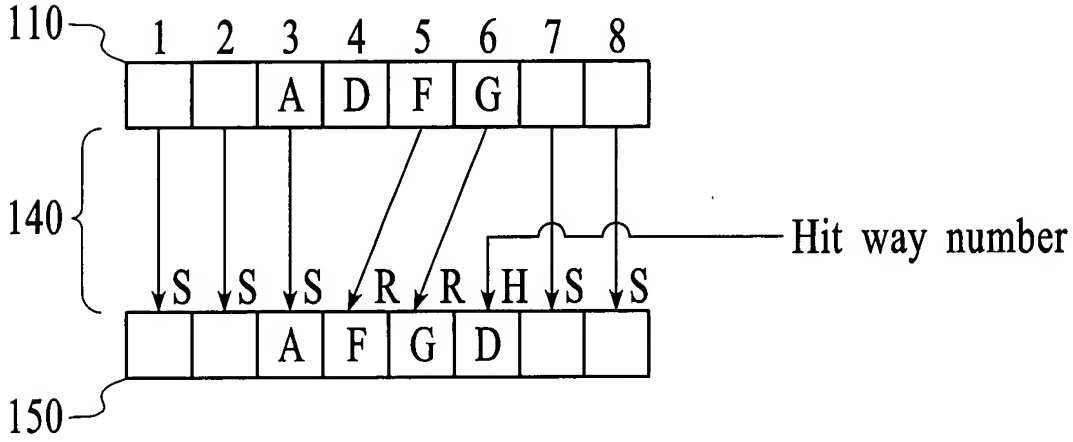
Table 1

FIG.5A



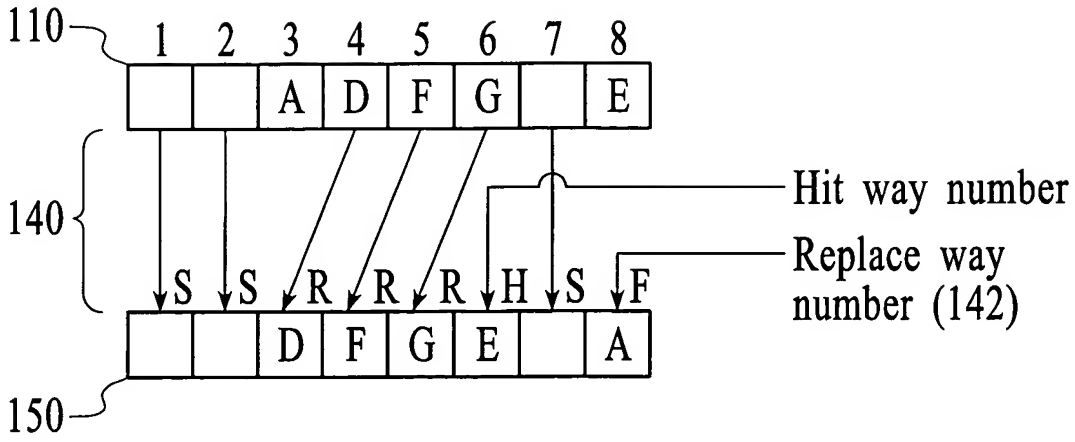
When a reference is a miss and the reference partition consists of positions 3-6.

FIG.6



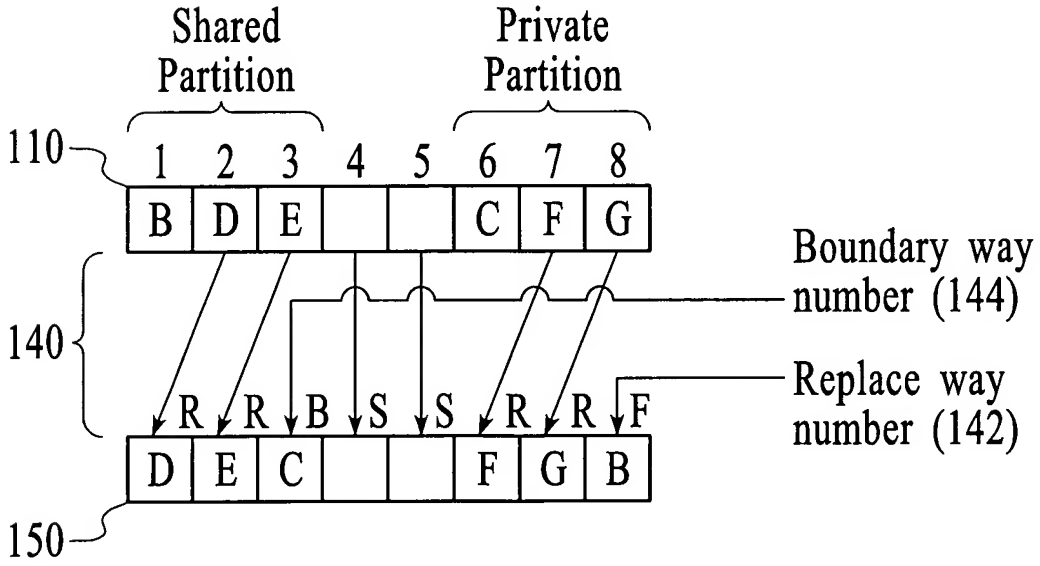
When a reference hits on way D that resides in a position within the reference partition consisting of positions 3-6.

FIG.7



When a reference hits on way E that resides in a position outside the reference partition consisting of positions 3-6.

FIG.8



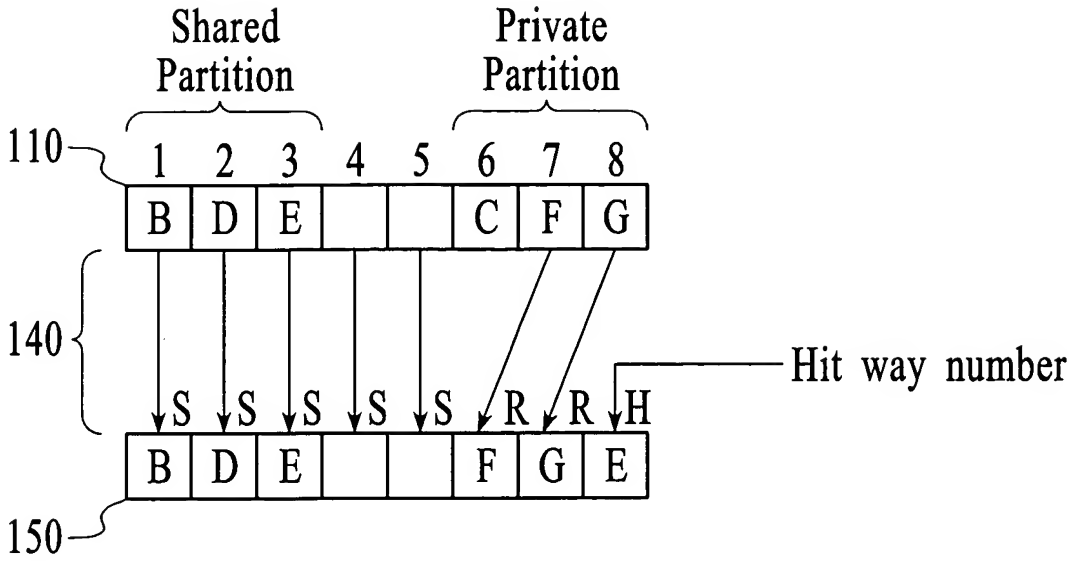
Miss

FIG.9

ID	Access Result	mux 1	mux 2	mux 3	mux 4	mux 5	mux 6	mux 7	mux 8	Fsel
Y	miss	S	S	R	R	R	F	S	S	3
Y	hit 1	F	S	R	R	R	H	S	S	3
Y	hit 2	S	F	R	R	R	H	S	S	3
Y	hit 3	S	S	R	R	R	H	S	S	3
Y	hit 4	S	S	S	R	R	H	S	S	3
Y	hit 5	S	S	S	S	R	H	S	S	3
Y	hit 6	S	S	S	S	S	H/S	S	S	3
Y	hit 7	S	S	R	R	R	H	F	S	3
Y	hit 8	S	S	R	R	R	H	S	F	3

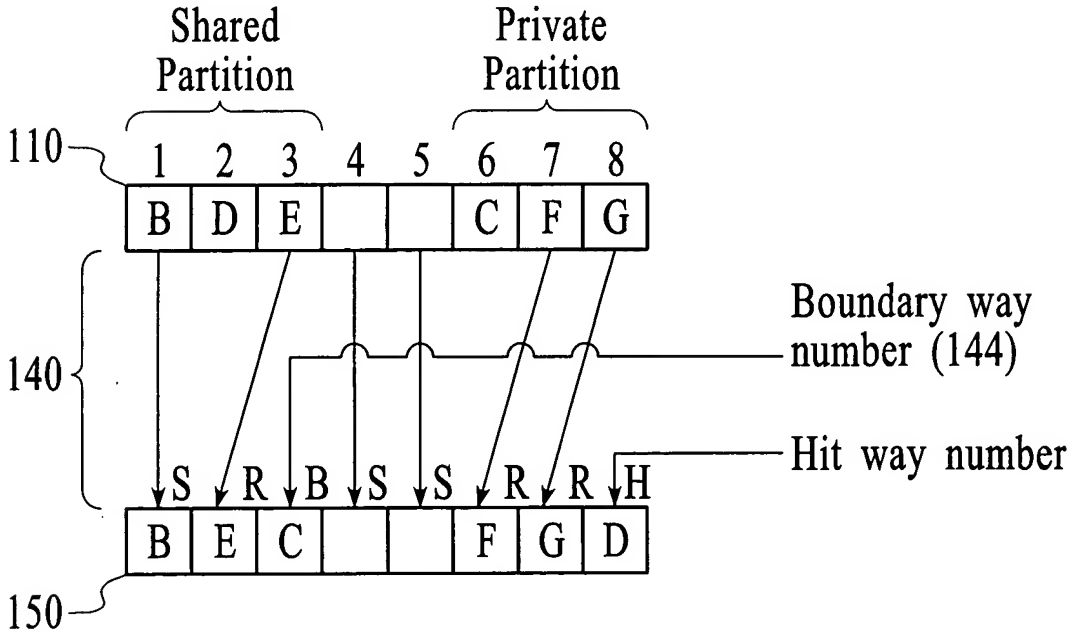
Table 2

FIG.8A



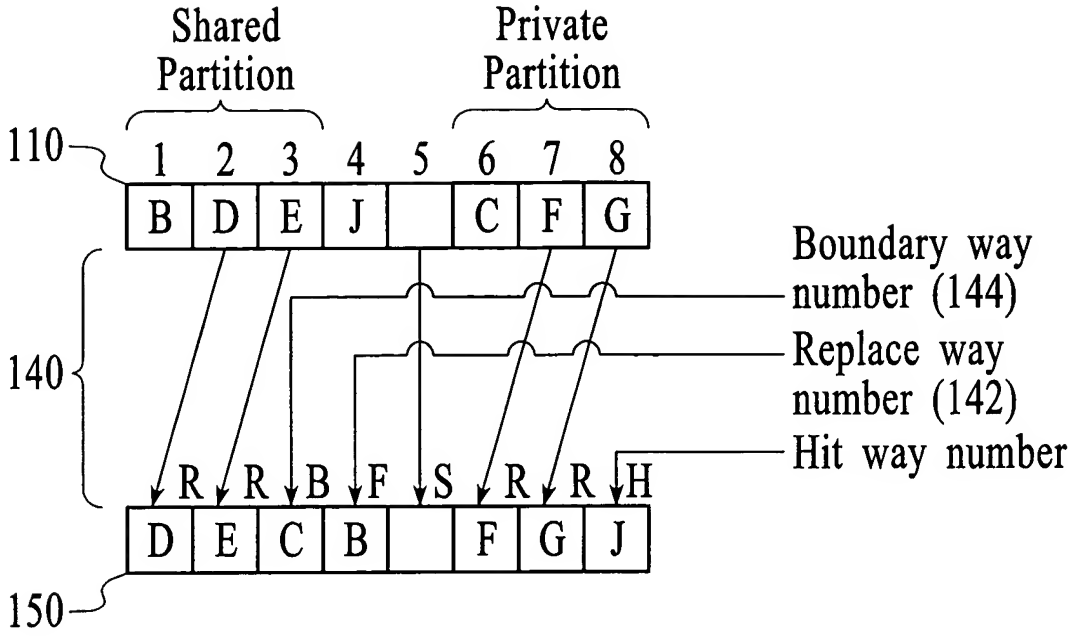
Hit on way C, which resides in private partition.

FIG.10



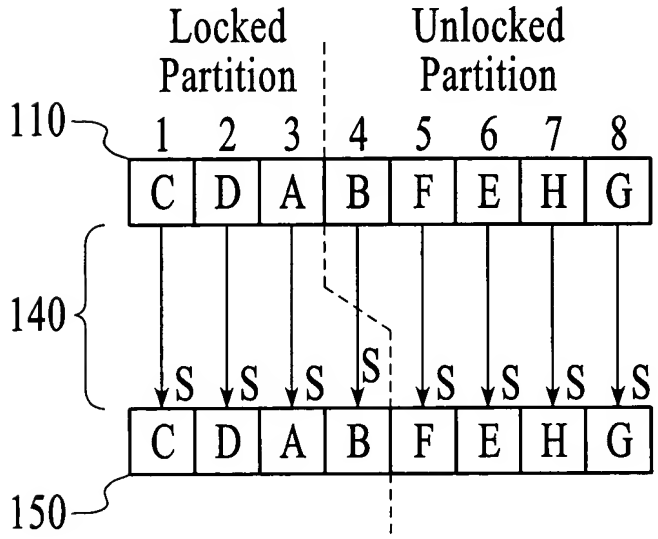
Hit on way D, which resides in shared partition.

FIG.11



Hit on way J, which resides outside the shared and private partitions.

FIG.12



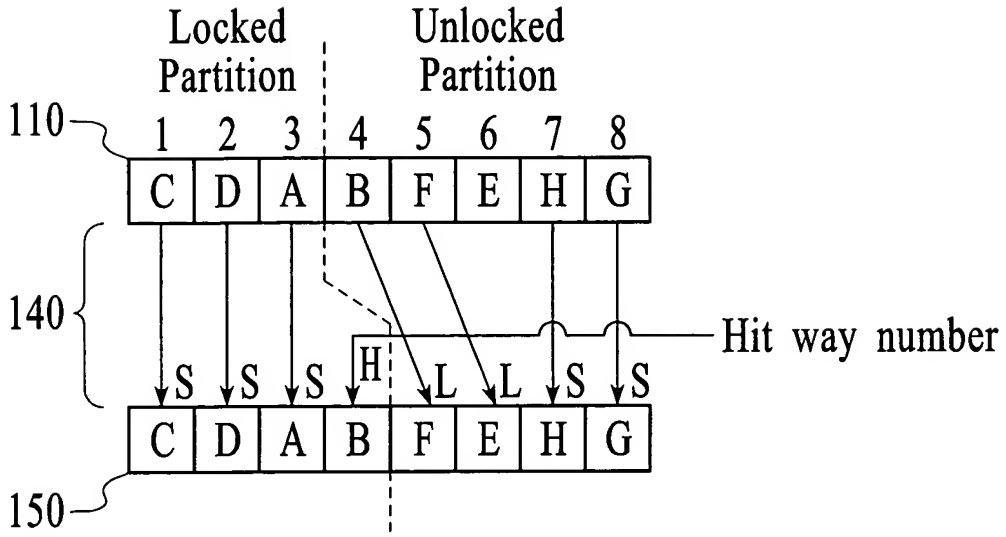
Locking an element that is not in the caching device.

FIG.13

ID	Access Result	mux 1	mux 2	mux 3	mux 4	mux 5	mux 6	mux 7	mux 8	Fsel	Bsel
W	miss	R	R	B	S	S	R	R	F	1	6
W	hit 1	R	R	B	S	S	R	R	H	1	6
W	hit 2	S	R	B	S	S	R	R	H	1	6
W	hit 3	S	S	B	S	S	R	R	H	1	6
W	hit 4	R	R	B	F	S	R	R	H	1	6
W	hit 5	R	R	B	S	F	R	R	H	1	6
W	hit 6	S	S	S	S	S	R	R	H	1	6
W	hit 7	S	S	S	S	S	S	R	H	1	6
W	hit 8	S	S	S	S	S	S	S	H/S	1	6

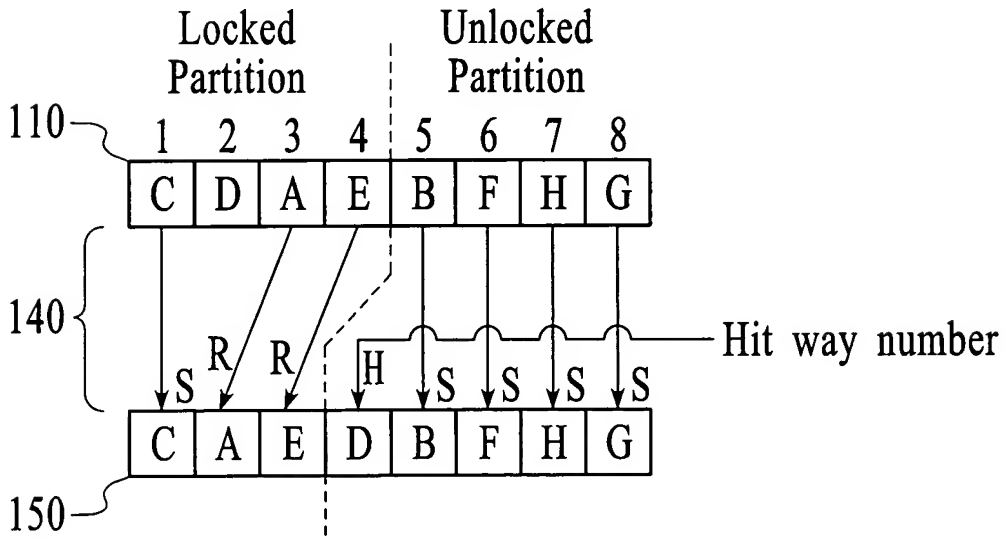
Table 3

FIG.12A



Locking an element that is in caching device but is unlocked.

FIG.14



Unlocking an element that is in caching device.

FIG.15